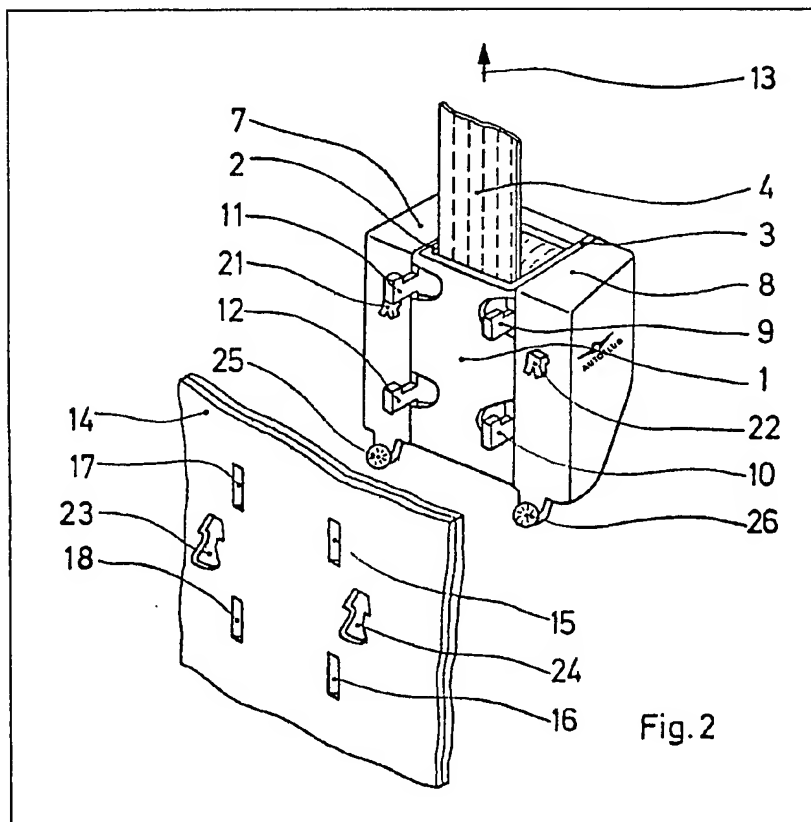


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(54) Safety belt reels

(57) To provide for easier mounting and greater security in use a belt-reeling mechanism for a vehicle safety belt is provided with four hook-like elements 9, 10, 11, 12 by which it may be fastened to support plate 14. The hooks engage behind the peripheries of registering apertures 15, 16, 17, 18 and the mechanism is held in this position by clips 21, 22 which engage in keyhole-like apertures 23, 24. Resilient pads 25, 26 prevent rattling. The clips 21, 22 can be replaced by a bolt, screw or rivet holding the two members together, or by resilient catch flaps extending from and integral with the side plates 7, 8 of the mechanism.





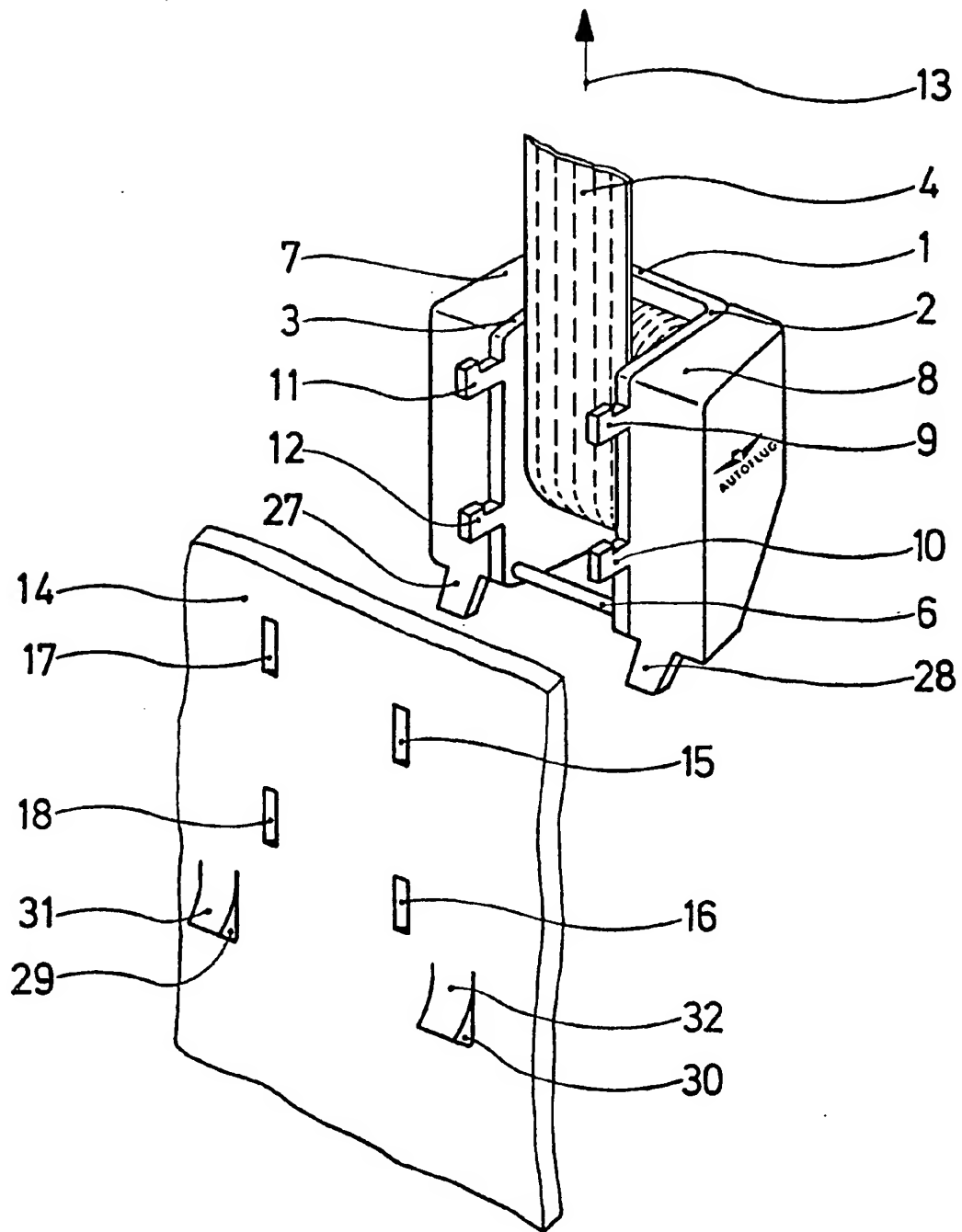


Fig. 3

SPECIFICATION

Improvements in or relating to safety belts

5 The invention relates to belt-reeling mechanisms for a safety belt which are fastened to an optionally reinforced structural part of a motor vehicle by at least one fastening member engaged in an opening in the structural part or in the housing of the belt-reeling mechanism.

Conventional belt-reeling mechanisms are, as a rule, fastened with a single screw to a corresponding body part which is reinforced because it does not otherwise possess sufficient strength. Arranged in the region of the reinforcement is a threaded bush into which is screwed the assembly screw for the belt-reeling mechanism. In case of stresses caused by an accident all the forces to be withstood by the belt-reeling mechanism must be transmitted to the body part by means of the assembly screw. In so doing, the assembly screw is stressed not only by tensile forces, but substantially also by bending moments which may be so large that they may deform not only the assembly screw, but also the parts connected thereto. To overcome the disadvantages associated therewith, belt-reeling mechanisms are also known, which are fastened with several assembly screws to the respective structural part of the motor vehicle (see German Auslegeschrift 1,257,591). Here, although the individual assembly screws are kept substantially free of bending moment stresses, the cost of manufacture and fitting is considerable.

The object of this invention therefore is to simplify the fastening and fitting of belt-reeling mechanisms and improve the function thereof.

According to the invention there is provided a belt-reeling mechanism for a safety belt for mounting to a structural part of a motor vehicle in which one of the housing of the mechanism or the structural part is provided with at least one projecting fastening element receivable in, and engageable behind the periphery of, a respective aperture formed in the other member, said other member being formed with means for fixedly receiving a locking member disposed on said one member and spaced from said fastening element(s).

The or each fastening element may comprise a simple projection, especially a hook or lug, which may be made without additional operations simultaneously with the stamping and bending of the housing of the belt-reeling mechanism. Fitting, also, is simplified, because the belt-reeling mechanism or its housing is merely to be hung with its hooks or lugs in the respective openings. Additional locking members in the form of rivets, pins or screws may optionally be used as locking means. However, it is more practical if the locking members are designed as resilient catches which engage automatically upon fitting. After fitting, the belt-reeling mechanism rests overall or supported at several bearing points against the respective body part, whereby the hooks which open in the pull-out direction of the safety belt substantially absorb the tractive forces and the support absorbs the force couples occurring upon

loading of the belt-reeling mechanism. The rigidity is substantially increased due to the 3-point or 4-point connection, possibly in accordance with the invention, of the housing to the body. The housing acquires greater strength and is deformed considerably less under load than with a 1-point connection.

Preferred embodiments of the invention are described hereinafter by way of example and with reference to the drawing wherein:

75 *Figure 1* is a perspective view of a belt-reeling mechanism with fastening device and associated body part,

Figure 2 is a perspective view of a further embodiment of the invention, and

80 *Figure 3* shows a yet further embodiment of the invention.

In the Figures like reference numerals designate like parts.

The belt-reeling mechanism illustrated in the 85 Figures has a U-shaped housing stamped and bent from a metal sheet and having a U crosspiece 1 and U legs 2, 3 adjoining it. The U legs have bearings for a belt shaft, not shown in detail, onto which the belt 4 is reeled into a roll 5. A stay 6 arranged at the ends of the U legs 2, 3 serves to reinforce the housing. Accommodated on the outsides of the U legs 2, 3 are further devices of the belt-reeling mechanism, such as, for example a winding device as well as a belt-sensitive and a vehicle-sensitive locking system, 95 which are each arranged protected under covers 7, 8.

Figures 1 and 2 show that the U crosspiece 1 has in the region of the U legs 2, 3 upper and lower punch-outs whose material forms hooks 9 to 12 which are bent up into the plane of the U legs. The 100 hooks are open in the pull-out direction of the belt 4 indicated by the arrow 13.

With these hooks 9 to 12 the belt-reeling mechanism is hung onto a body part which is reinforced with a reinforcing plate 14. The reinforcing plate 14 has 105 slots 15 to 18 which correspond to the hooks 9 to 12 in location, width and height. Consequently, the belt-reeling mechanism may be hung with the hooks 9 to 12 in the slots 15 to 18 and then displaced in the direction of the arrow 13, so that the hooks 9 to 12 engage behind the peripheries of the slots 15 to 18 corresponding to the open sides of the hooks.

In order to prevent the belt-reeling mechanism from being displaced in relation to the reinforcing plate 14 due to external forces in its own weight, the reinforcing plate 14 has a bore 19 which receives a 115 pop rivet 20 on which the housing of the belt-reeling mechanism is supported in a corresponding way or which is held in a corresponding bore of the housing.

With the embodiment shown in Figure 2 resilient catches in the form of clips 21, 22 are moulded onto the rear sides of the cover 7, 8 consisting of a plastics material. The clips 21, 22 correspond to openings 23, 24 in the reinforcing plate 14 with a keyhole-like 125 cross section, into which the clips 21, 22 engage upon fitting of the belt-reeling mechanism and in whose narrower cross section they engage when the belt-reeling mechanism is pushed upwardly in the direction of the arrow 13.

130 Additionally, with the embodiment shown in Fi-

figure 2, there are moulded onto the undersides of the covers 7, 8 resilient lugs 25, 26 which project beyond the rearside of the covers and which are intended to prevent the belt-reeling mechanism rattling against the reinforcing plate.

With the embodiment shown in Figure 3 the hooks 9, 10, 11, 12 are connected or moulded upon stamping to the free margins of the U legs 2, 3 of the housing and the U-shaped housing is correspondingly placed with its open side against the reinforcing plate 14. Interlocking of the housing with the reinforcing plate is achieved by tongues 27, 28 which are moulded onto the lower rearward edge of the covers 7, 8 and which project at an angle to the rearside and underside of the housing. Corresponding to these tongues 27, 28 are openings 29, 30 in the reinforcing plate 14 which have been made by punching-out, the punched-out material remaining connected on one side to the material of the reinforcing plate 14, so that tongue-like flaps 31, 32 are obtained, which form abutments for the tongues 27, 28. Since the tongues, like the associated covers 7, 8, consist of a plastics material, they possess resilient properties and may therefore simultaneously assume the securing and rattle preventing functions of the clips and lugs shown in the embodiment of Figure 2.

The reinforcing plates may be single plates (Figure 3), double plates (Figure 2) or moulded parts (Figure 1) which are attached to corresponding structural parts of the body by spot-welding, for example during body production.

Moreover, the possibility also exists of designing the slots 15, 16, 17, 18 so that, upon fitting, the belt-reeling mechanism is moved firstly in the direction of the arrow 13 and then transversely thereto, in order to bring it into its final position provided.

The features of the invention disclosed in the description, the patent claims and the drawing may be substituted either individually or in any combinations with one another for realisation of the invention in its various embodiments.

45 CLAIMS

1. A belt reeling mechanism for a safety belt for mounting to a structural part of a motor vehicle in which one of the housing of the mechanism of the structural part is provided with at least one projecting fastening element receivable in, and engageable behind the periphery of, a respective aperture formed in the other member, said other member being formed with means for fixedly receiving a locking member disposed on said one member and spaced from said fastening element(s).

2. A belt reeling mechanism according to claim 1 in which there are provided on the housing four said fastening elements in the form of hook-like elements opening in the pull-out direction of the belt and engageable in respective slot-like apertures formed in said structural part.

3. A belt reeling mechanism according to claim 2 in which said hook-like elements are moulded on the housing.

4. A belt reeling mechanism according to claim 2 or 3 in which the housing is of U-shaped cross section and said hook-like elements are disposed in the planes of the legs of the U.

5. A belt reeling mechanism according to claim 4 in which the hook-like elements are formed from the cross-piece of the U and bent up into the plane of said legs.

6. A belt reeling mechanism according to any of the preceding claims in which said locking member is a pop rivet or a bolt.

7. A belt reeling mechanism according to any of claims 1 to 5 in which said locking member comprises a resilient catch.

8. A belt reeling mechanism according to claims 4 and 7 in which the U legs of the housing are connected to side parts of plastics material, and a said resilient catch is moulded onto each side part.

9. A belt reeling mechanism according to claim 7 or 8 comprising a plurality of said catches formed as clips which engage in respective apertures of keyhole-like cross section formed on the structural part.

10. A belt reeling mechanism according to claim 7 or 8, comprising a plurality of said catches formed as tongues which are curled rearwardly from the housing side and to each of which correspond respective apertures with flap-like abutments for the tongues.

11. A belt reeling mechanism according to any of the preceding claims including one or more resilient supports between the belt-reeling mechanism and structural part.

12. Belt reeling mechanisms substantially as hereinbefore described with reference to the accompanying drawings.

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